



Silica Scaling Removal Process

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Applications:

- Cooling tower systems
- Water treatment systems
- Water evaporation systems
- Potential mining applications (produced water)
- Industry applications for which silica scaling must be prevented

Benefits:

- Reduces scaling in cooling towers by up to 50%
- Increases the number of cycles of concentration substantially
- Reduces the amount of antiscaling chemical additives needed
- Decreases the amount of makeup water and subsequent discharged water (blowdown)
- Enables considerable cost savings derived from reductions in facility down time, maintenance, and chemical additives
- Reduces the amount of water needed to operate the system

Summary:

The build-up of scaling from dissolved and colloidal silica in cooling towers and evaporation systems is a major problem that costs industry millions of dollars each year in facility down time, maintenance, discharge water treatments (blowdown), and anti-scaling chemical additives. This is particularly true for cooling towers and evaporation system facilities based in silica-rich regions, including the Western United States.

Scientists at Los Alamos National Laboratory have developed a novel technology to remove both dissolved and colloidal silica using small gel particles. These innovative gel particles remove both types of silica from slip streams or sidestreams of cooling tower water by providing a substrate for the deposition and adsorption of silica. The removal of the silica prevents scaling deposition on heat transfer components of cooling towers and other evaporation systems. Experimental results have shown that this technology can reduce scaling by up to fifty percent. In addition, the removal of silica from the cooling tower basin water increases the potential cycles of concentration, thus reducing the need for makeup water and blowdown discharge. Considerable cost savings are realized when even a fraction of the existing silica is removed.

Development Stage:

Technology Readiness Level: 3 - Component prototypes built and proof-of-concept testing completed

Patent Status:

Purification of Water from Cooling Towers and Other Heat Exchange, [US Patent No. 8,236,181\(DOE S-116,244\)](#), Patent Publication Date: August 7, 2012

Licensing Status:

Available for exclusive or non-exclusive licensing and collaborative agreements.

For more information, contact Licensing@lanl.gov.

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